

## Personal experiences in the malaria eradication campaign 1955–1962

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By the 1950s the age-old scourges of smallpox, cholera, plague, typhus and yellow fever had declined in economic and political importance. Other infectious diseases, however, were still the main cause of death and invalidity in the world. With an extraordinary sense of international purpose the Eighth World Health Assembly, in 1955, singled out malaria as the first priority and set up the most grandiose health project ever undertaken. Encouraged by success in South America and by scientific assurances that eradication was feasible, governments of malaria-afflicted countries went into action. Many aid organizations were involved, but the World Health Organization (WHO) was responsible for overall coordination and for the technical approval of individual projects. Vast quantities of men, money and materials were mobilized. Great efforts were made by even the poorest countries. It was a project worthy of *Homo sapiens* at his best. Yet it failed in its main objective of eradicating the disease<sup>1</sup>.

From 1955 to 1962 I was WHO's Representative in Cambodia, Laos and Vietnam. Among other things, I looked after WHO-assisted programmes, advised the governments on public health matters and liaised with various participants. Malaria was prevalent in all three countries, and when the national programmes started to roll, the voices of a few Jeremiahs were drowned in the clamour to get on and finish the job.

The strategy was simple, and with minor variations national plans followed a standard pattern. That for Cambodia will serve as a general example. In that country, infection was spread by an anopheline mosquito called 'Minimus'—a small, innocent-looking insect. When a female ingested blood from an infected person whose blood contained the parasite, she imbibed some malarial parasites along with it. The parasites, finding themselves in new surroundings, prepared themselves for transfer to some new, unfortunate human host. The metamorphosis takes a couple of weeks, during which the parasite is harmless. At the end of two weeks the metamorphosed parasites have installed themselves in the salivary glands of the mosquito. Before sucking blood, the mosquito injects a

little saliva (which now contains malarial parasites) into the new human host, completing the cycle.

After feeding, mosquitoes like to rest for a while, and normally do so on the nearest wall. If the wall had been sprayed with the new wonder chemical DDT, the now-infected mosquito would receive a lethal dose and expire before it could infect another human being. Transmission would therefore be interrupted. It was planned that eradication would be achieved within 5 years. A geographical reconnaissance was necessary to map the targeted area, as the interior of every house had to be sprayed within a specific period.

### THE CAMBODIAN CAMPAIGN

Preparations were far advanced when the Minister of Health told me that the Buddhist community could be expected to oppose the project and that this could ruin the whole campaign. Would I talk to the Chief Bonze and explain the programme to him. An explanation would come better from a respected outsider than from himself or from the Americans, who were largely funding the programme.

A few days later my car, wearing its WHO pennant, deposited me at the entrance to the green and yellow pagoda in Phnom Penh. I was to be received by the head of the community himself. A monk awaited me at the foot of the steps. He was a personable young man, his head shaven, clad in a bright yellow robe. He welcomed me in passable French, and conducted me to his master.

His Eminence was an old man, past 80. The young man interpreted for us. After the usual formal exchange of greetings, the conversation wandered over several subjects, but malaria was not among them. The audience lasted about half an hour, and I felt that some degree of rapport had been established. His Eminence said he would like to continue our conversation in a week's time. And so we did.

This time, after the preliminaries, we addressed the reason for my visit. His Eminence knew about malaria and agreed that it was a scourge the country would be better without. I explained the rationale of the campaign, emphasizing that we were aiming to free the population of the death, suffering and general debility for which malaria was responsible. Only a relatively few mosquitoes would be eliminated. His Eminence listened patiently and

thanked me when I had finished. 'That is very interesting, Doctor, but as you know, our religion does not permit the killing of other living things except for food, and now I understand you are planning to kill mosquitoes . . . ' 'Only a few of them,' I countered. 'The aim is to eradicate malaria, not mosquitoes'. I wondered where the malaria parasite, indubitably something living, figured in his scheme of things, but he did not raise the question. 'I will discuss this with my colleagues. Let us meet again.'

A week later I mounted those imposing steps once more. Our young interpreter indicated the seat beside his master. We talked as we sipped orange juice, and at last we came to the problem of malaria. 'I am pleased to be able to tell you that we Buddhists will not oppose your programme. However, we will not be able to actively support it . . . ' I wondered whether it would be possible to improve on this half-victory. 'Can you tell me, Eminence, how you managed to persuade your colleagues?' He smiled. 'You see, Dr Brown, when the mosquitoes take their siesta on the wall, they are killing themselves. That, for us, is not a crime'.

## VIETNAM

### The Mois

The Mois are a tribal people living in the mountain range that runs through Vietnam. Generations ago they were forced up into the mountains by the Chinese-related Vietnamese when these came south under pressure from the Chinese in the north. They lived in simple grass and mud *paillottes* and were much afflicted by malaria. It was essential to include these areas in the country's eradication campaign, but the isolation, terrain and lack of communications presented special difficulties.

I went into the area on a routine visit to see the conditions and how the local teams were getting on. The Vietnamese team leader was a competent man, and generally satisfied with progress. 'However', he said, 'we are having some difficulty in one batch of villages . . . They seal their *paillottes* at night and will not allow us to place our traps on the walls, though they are happy enough for us to spray the insides during the day.' As a check on the efficiency of the spraying and also to gather more information on the mosquito population, small boxes had to be set up to trap mosquitoes as they left the huts at night. This meant making a small hole in the wall of the hut. The villagers just refused to allow this.

The village was situated beside a stream on a plateau in open country. Villagers gathered round to welcome us and it was evident that they were happy with the results of the spraying—though more because of the reduction in the bed-bug population than because of any noticeable effect on malaria. When I asked about their objection to the boxes I

met with shaking heads. It was not the boxes, I was told. It was the holes. They would let in evil spirits. 'How powerful are these spirits?' I asked. 'Very powerful and dangerous' came the reply. 'How big are these spirits? If they are so powerful, surely they must be very large?' This started off quite a discussion . . . After a while the interpreter told me that they had concluded that they must be pretty large. I told him to ask whether a spirit was larger than a mosquito, which, after all, was quite small and not very powerful. After more discussion, I gathered that the general opinion was that a spirit had indeed to be larger than a mosquito.

'If', I asked, 'the mosquitoes cannot escape, how can a much larger evil spirit enter?' So the problem was settled and the boxes were put in place—on condition that the holes were made during the day.

### The Vietminh

The malaria eradication programme in Vietnam had had the full support of government, US-AID and WHO. At first it made good progress. The Vietminh tolerated the work of the spray teams until there was a suspicion that the project was being used for military information purposes. In the face of harassment and vandalization of transport, adherence to the planned programme became impossible. The WHO project staff complained about this to me. In turn I passed it on to the Regional Director in Manila who confirmed that WHO's technical requirements must be observed. I explained this to the American project chief with whom I was on friendly terms.

'If you cannot adhere to WHO's technical requirements, I am afraid WHO will have to pull out of the project. After all, our contribution is just a couple of malariologists. You have several of your own so you will hardly miss us'. A few hours later the US Ambassador asked me to come over to the Embassy. 'What's this I hear about WHO pulling out of the malaria project?', he asked. I explained the position to him pointing out that WHO's contribution was just the two malariologists and that the US project leader saw no insurmountable difficulty in carrying on without them. 'Indeed we would be sorry to lose your malariologists', said the Ambassador, 'but it is true that we can manage without them. If necessary we could replace them from project funds. That is not the problem. The eradication project is an international affair. WHO sets the technical requirements to which we have to adhere. If WHO withdraws its staff because the programme does not meet those standards, I don't think we can go to Congress for the funds. Please, see what you can do'.

I reported our conversation to my Regional Director and was instructed to go immediately to headquarters in Geneva. There I met with Dr Alvarado who headed the Malaria Division. He was very angry but adamant that

adherence to WHO's technical requirements was a *sine qua non* for the Organization's support. In the event the WHO staff were withdrawn, but somehow we remained associated with the project. It was the first time I realized that WHO had considerable political clout. It was also a reminder that WHO's technical advice had to be realistic as well as sound.

### SPIN-OFFS

There were other causes of failure than those in Cambodia and Vietnam. Perhaps the most important was the rapid development of immunity to DDT and later to other insecticides.

Eradication was achieved in some countries such as Greece, where the infection rate was low and parasitic transmission already tenuous. (The 'ague' had been common enough in some parts of England in medieval times, but disappeared spontaneously with improving land management and agriculture.) The potential for small outbreaks still remained and was demonstrated when the disease was reintroduced by persons returning from malarious areas, as happened in the UK after both world wars.

To most experienced public health workers, world-wide eradication had seemed too grandiose an aim from the start. Too much reliance had been placed on the technical feasibility of the campaign and too little on the general complexity of interacting economic, cultural and logistic

problems. But politicians and other decision-makers were dazzled by the power of DDT and the enthusiasm of specialist malariologists.

The need to abandon the attempt after the lengthy deployment of such massive resources was a major embarrassment to many governments and to WHO itself. Not surprisingly, the eradication programme ceased to be mentioned. 47 years on we can afford to examine its history again. Those who plan major campaigns against tuberculosis, poliomyelitis and the like should not underestimate the complexity of the social, cultural, economic, geological, climatic and biological factors that are part and parcel of the problems. Not to mention politics.

Nor should the spin-off benefits be forgotten. Malaria was eradicated in some countries. Geographical reconnaissance produced the first maps for many remote areas. Malaria teams were the first trained government health workers to reach many rural areas. They brought new health concepts with them. After the formal eradication programmes ended, the disbanded teams provided a pool of potential workers for environmental improvement. I doubt, too, whether smallpox would have been successfully eliminated had it not been for the lessons learned during the malaria eradication programme.

### REFERENCE

- 1 Najera JA. Malaria and the work of WHO. *Bull World Health Organ* 1989;67:229-43